

React Native Architecture

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How React Native works, What issues it has and how they will be addressed in the React Native new architecture.

- **Is RN another Hybrid framework ?**
- **Does it compile JS to Native code ?**
- **Is it performant enough for my case ?**

Architecture

- Shadow Queue

Layouting

- Main Thread

Native UIKit

- Javascript Thread

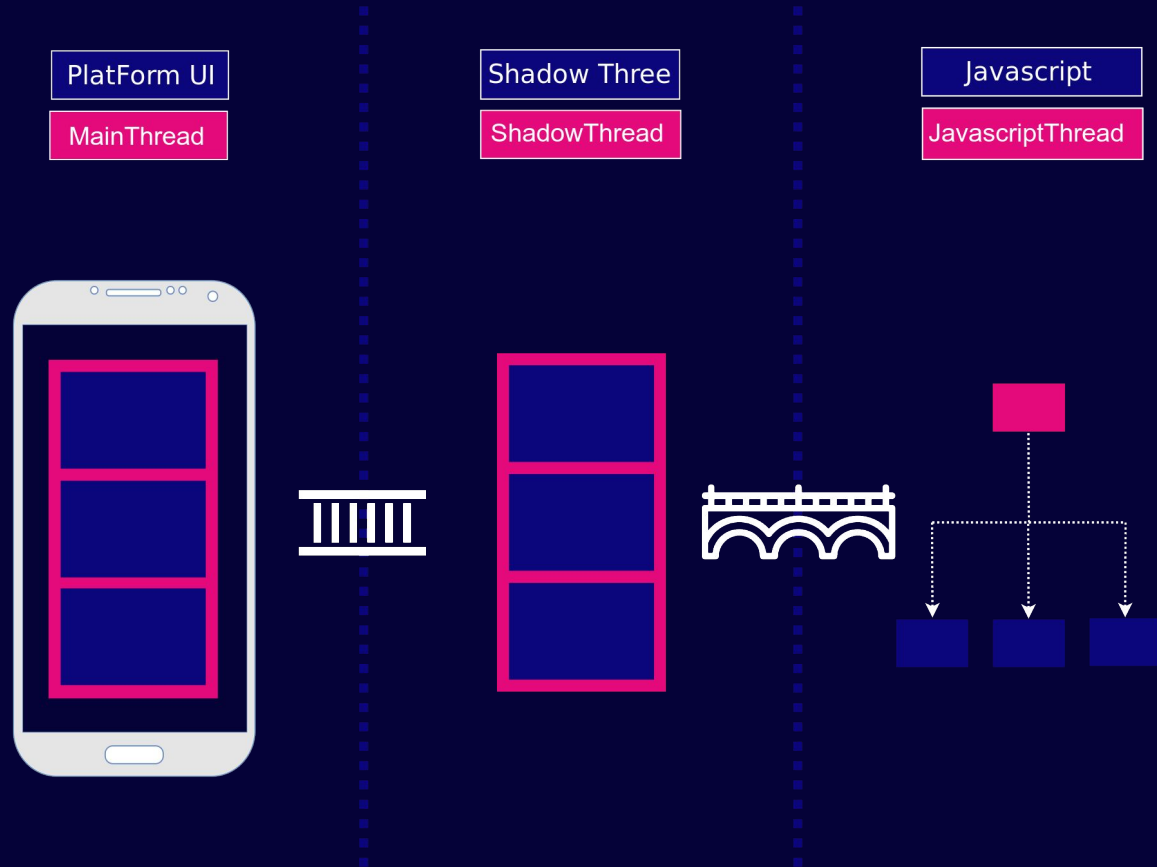
Javascript code

So...

JS is running inside mobile app :D

- How ?
- Is it Performant ?

Existing Architecture



Bridge pros

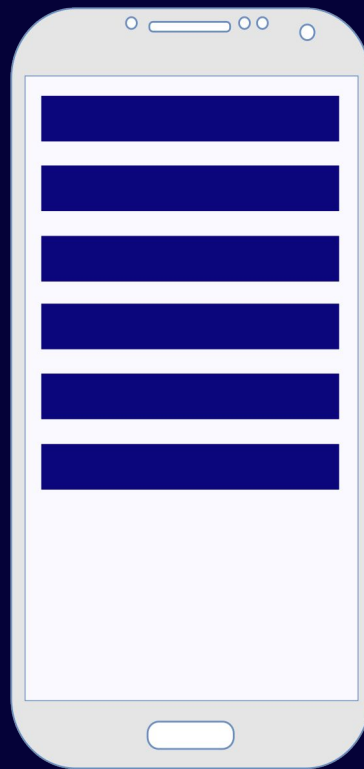
1. Keeping every thread independent
2. Blocking JS code does not affect UI

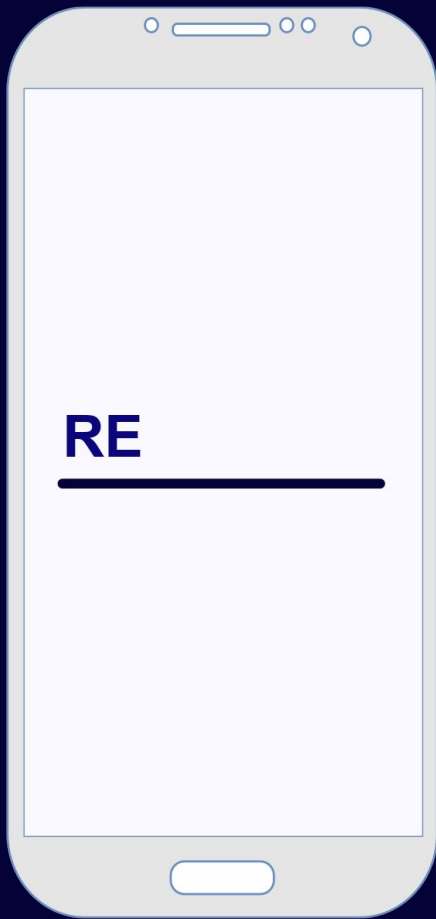
Bridge Cons

1. Asynchronous delay
2. Serialization Cost
3. Instante event handling
4. Imperative Animations
5. Instante layout updates
6. Native modules lifecycle bounds to bridge
7. Blocking JS during initialization of native modules and view managers

Examples of Bridge side effects

Infinite Scroll Rendering Delay





```
<TextInput onChangeText={...} value={state.text} />
```

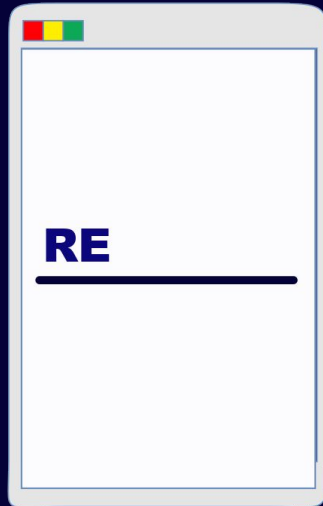
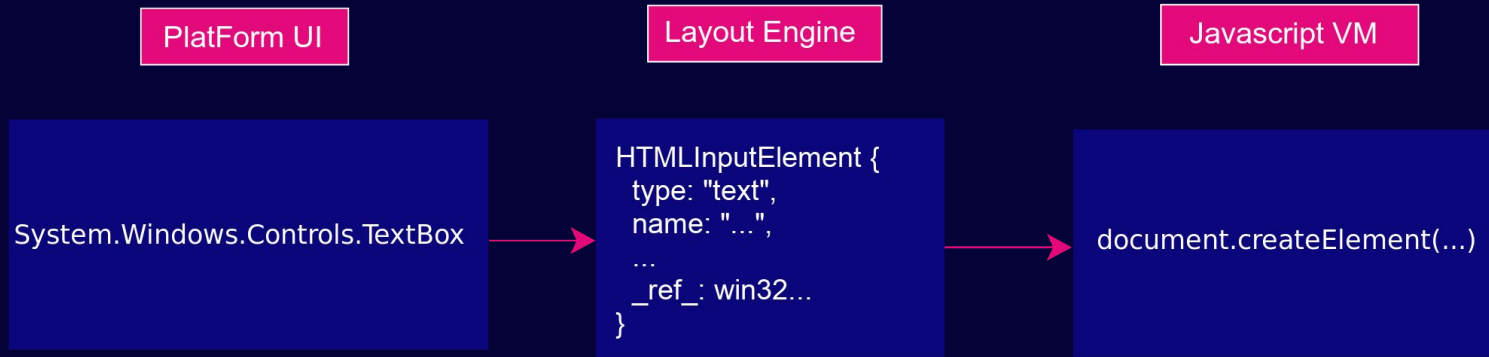
R → onChangeText('R')

E → onChangeText('RE')

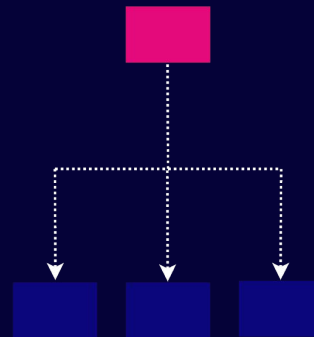
R ← setValue('R')

RE ← setValue('RE')

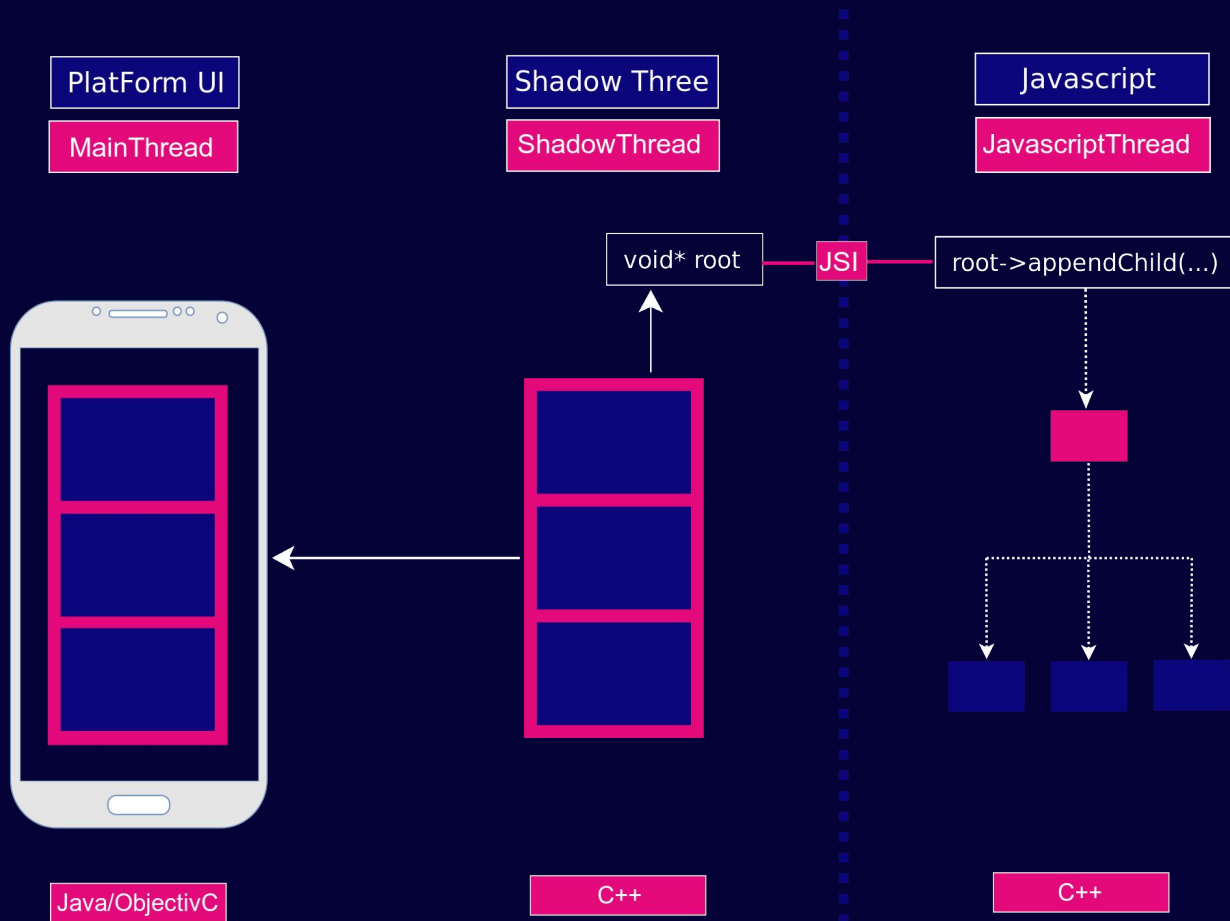
Host Object



`<input type="text" />`



Existing Architecture



New Architecture Benefits

1. Shared Memory instead of Serialization
2. Executing Shadow Tree & Layout Computation on every thread
3. Asynchronous data access issues will resolve using Immutability
4. Shadow Tree and Layouting will be implemented using C++
5. Native Modules life cycle depends on JS reference only
6. Code generation replaces initialization

New Terminology & Elements

1. Fabric, The UI Layer

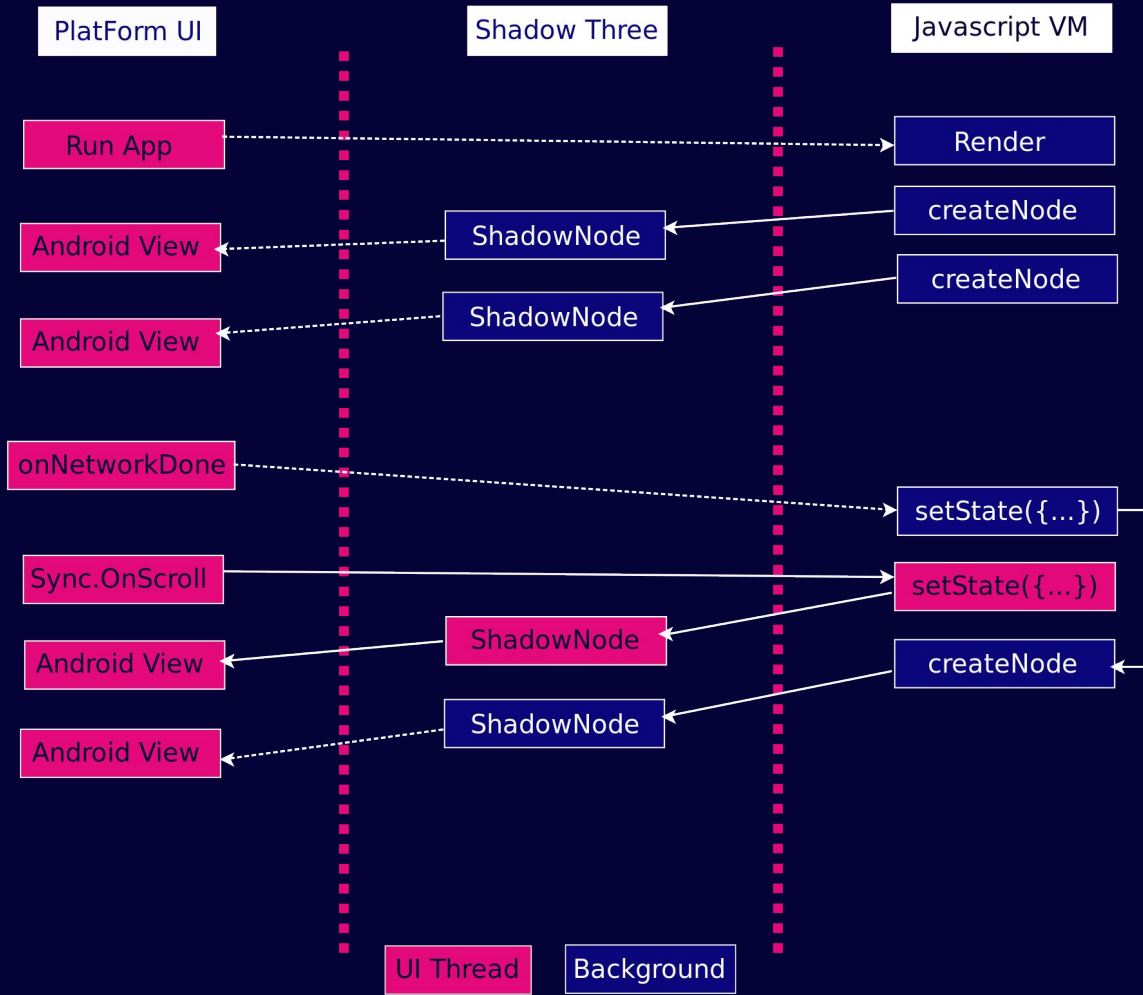
New Implementation of UI components. Using non-blocking rendering & Concurrent React

2. JSI

A part of JS VM that handles communication between JS and Shadow Thread

3. Turbo Module

New Implementation of Native modules



Javascript Blocking Code

1. Don't block js thread
2. Concurrent React / non-blocking rendering
3. Opt-in synchronous execution

What's the timeline for Fabric's first stable release?

- RN team didn't announced any public deadline or timeline.
- It's also hard to define what stable actually means for Facebook and for external users.

What does Fabric mean for developers

1. Fabric doesn't affect native modules API directly.
2. special kind of NativeModules called ViewManagers have to be rewritten.
3. Breaking changes will be as small as possible.
4. It's possible to enable Fabric on screen level - they did it on FB app
5. Replacing old framework is the goal.

Thank you for your patience

#ReactConf